

WHAT IS CLAIMED IS:

1. A planetary gear apparatus comprising an inner gear and a sun gear which are rotatably arranged with axes thereof aligned with a rotation axis, at least one planetary gear arranged in parallel with said inner gear and sun gear and engaged therewith, and a carrier rotatably arranged with an axis thereof aligned with said rotation axis and formed therein with a receiving hole for rotatably receiving said planetary gear over a generally entire length thereof, an engagement part between said inner gear and said planetary gear are displaced with an engagement part between said sun gear and said planetary gear in a direction of said rotation axis so that said engagement parts are not overlapped with each other.
2. A planetary gear apparatus according to claim 1, wherein said engagement part between said inner gear and said planetary gear and said engagement part between said sun gear and said planetary gear are displaced such that end parts of said engagement parts which are adjacent to each other in a direction of said rotation axis are located nearly at the same position in a direction of said rotation axis.
3. A planetary gear apparatus according to claim 1, further comprising a first supporting part for supporting an outer peripheral surface of said planetary gear corresponding to said engagement part between said inner gear and said planetary gear from an inner side than the planetary gear in a radial direction of said inner gear, and a second supporting part for supporting an outer peripheral surface of said planetary gear corresponding to said engagement part between said sun gear and said planetary gear from an outer side than said planetary gear in a radial direction of said sun gear.

4. A planetary gear apparatus according to claim 1, wherein said inner gear, said sun gear and said planetary gear each have helical teeth, a plurality of said planetary gears are provided, an engaging phase of said at least one planetary gear with respect to said inner gear and sun gear is different in phase from an engaging phase of another planetary gear with respect to said inner gear and sun gear.

5. A planetary gear apparatus comprising an inner gear and a sun gear which are rotatably arranged with axes thereof aligned with a rotation axis, and a plurality of planetary gears engaged with said inner gear and sun gear, said planetary gears are arranged at non-uniform interval in a peripheral direction of said sun gear so that when said planetary gears urge said sun gear in the radial direction by engagement with said sun gear, a resultant force of the urging force acts in one direction in a radial direction of said sun gear, and a sun gear supporting member for supporting an outer peripheral surface of said sun gear is disposed at the outside of said sun gear on a forward side in said one direction.

6. A planetary gear apparatus comprising an inner gear and a sun gear which are rotatably arranged with axes thereof aligned with a rotation axis, and a plurality of planetary gears engaged with said inner gear and sun gear, said planetary gears are arranged at non-uniform interval in a peripheral direction of said inner gear so that when said planetary gears urge said inner gear in the radial direction by engagement with said inner gear, a resultant force of the urging force acts in one direction in a radial direction of said inner gear, and an inner gear supporting member for supporting an outer peripheral

surface of said inner gear is disposed at the outside of said inner gear on a forward side in said one direction.